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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/614,293 | 07/08/2003 | Jong-Weon Moon | 8733.903.00-US | 7386 |
| 30827 | 7590 | 09/12/2005 | EXAMINER | |
| MCKENNA LONG & ALDRIDGE LLP 1900 K STREET, NW WASHINGTON, DC 20006 | | | CALEY, MICHAEL H | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2871 | |

DATE MAILED: 09/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/614,293 | MOON, JONG-WEON | |
| | Examiner | Art Unit | |
| | Michael H. Caley | 2871 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 12-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-7 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moon (U.S. Patent Application Publication 2001/0026335 "Moon '335" in view of Moon et al. (KR 2001-0111863 "Moon '863").

Regarding claim 1, Moon '335 discloses a liquid crystal display having:

first and second substrates (Figure 5 elements 550 and 500) facing and spaced apart from each other;

a retardation layer (Figure 5 element 552) on an outer surface of the first substrate;

a linear polarizing layer (Figure 5 element 554) on the retardation layer;

a cholesteric liquid crystal color filter (Figure 5 element 200) layer on an inner surface of the second substrate and having a first helical pitch of a first circular polarization direction (Page 1 [0014]);

a first cholesteric liquid crystal polarizing layer (Figure 5 element 150) on an outer surface of the second substrate and having a first helical pitch of a first circular polarization direction (Page 4 [0052]); and

a backlight unit outside the second CLC polarizing layer (Figure 5 element 50).

Moon '335 fails to disclose a second CLC polarizing layer on the first CLC polarizing layer having a second helical pitch of a second circular polarization direction opposite to the first circular polarization direction. Moon '863, however teaches a combination of first and second CLC polarizers adjacent to one another having opposite helical pitch directions (Figure 3 elements 12 and 13a; Column 5, line 9 – Column 6 line 10) in addition to a cholesteric color filter (Figure 3 element 15).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have configured the display device disclosed by Moon '335 to have first and second CLC polarizing layers having pitch directions of opposite directions according to the teachings of Moon '863. One would have been motivated to form an additional CLC polarizing layer according to the teachings of Moon '863 to efficiently make use of the light from the light source by repetitively reflecting the light between the CLC layers and the reflecting plate and so that it may exit the CLC color filter in a specific visible light band (Column 5 line 54 – Column 6 line 5). Such an improvement is taught by Moon '863 to improve the efficiency of the light source and the color purity of the display (Column 2 lines 3-30).

The examiner notes that U.S. Patent No. 6,597,418 to Moon et al. is used as an English version of the Korean document.

Regarding claims 2-7, Moon '335 fails to disclose the first and second CLC polarizers having the proposed properties. Moon '863, however, teaches one CLC polarizing layer as

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having a discrete pitch (element 13a) and one CLC polarizing layer having a continuous pitch (element 12). Moon '863 teaches the discrete helical pitch as corresponding to bands of wavelengths adjacent to red, green and blue colors (Column 5 lines 29-31, 54-65) and the second helical pitch as corresponding to a broadband of wavelength (Column 5 lines 23-65). Moon '863 further teaches the CCF layer as having a third helical pitch in the same direction of the discrete pitch corresponding to wavelengths of red, green and blue colors (Column 5 line 54 – Column 6 line 11) and each of the cholesteric layers as having one of a right-handed and left-handed polarization direction (Column 5 lines 23-31).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have configured the display device disclosed by Moon '335 to have first and second CLC polarizing layers having pitch directions as proposed. One would have been motivated to form an additional CLC polarizing layer according to the teachings of Moon '863 to efficiently make use of the light from the light source by repetitively reflecting the light between the CLC layers and the reflecting plate and so that it may exit the CLC color filter in a specific visible light band (Column 5 line 54 – Column 6 line 5). Such an improvement is taught by Moon '863 to improve the efficiency of the light source and the color purity of the display (Column 2 lines 3-30).

Regarding claim 11, Moon '335 discloses the retardation layer as a quarter wave plate (Page 4 [0051]).

Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moon '335 in view of Moon '863 and in further view of Honda et al. (U.S. Patent No. 2002/0012085 "Honda").

Moon '335 as modified by Moon '863 fails to disclose a diffusing layer between the first substrate and the retardation layer and a compensation layer between the retardation layer and the linear polarizer. Honda, however, teaches such a diffusing layer as an improved method of scattering light in a transfective display (Page 1 [0004]-[0006]); Figure 9 element 11). Furthermore, Honda teaches a compensation layer of viewing angle (22) between the retardation layer (23) and the linear polarizer (21).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have formed a diffusing layer and compensation layer of viewing angle as proposed in the display device disclosed by Moon '335. One would have been motivated to construct the display device with such a diffusing layer and compensation layer as a means of maintaining uniform viewing characteristics such as color and brightness across a range of viewing angles (Page 1 [0006]-[0009]).

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moon '335 in view of Moon '863 and in further view of Arakawa et al. (U.S. Patent Application Publication No. 2002/0036735 "Arakawa").

Moon '335 as modified by Moon '863 fails to disclose the backlight unit as emitting light of a spectrum having peaks at wavelength bands corresponding to red, green, and blue colors.

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Arakawa, however, teaches such a light source used in combination with a cholesteric liquid crystal polarization layer in a liquid crystal display (Page 2 [0035]).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a backlight having an emission characteristic as proposed. One would have been motivated to use such a backlight having an emission spectrum with peaks at red, green, and blue so that a higher percentage of the light may be transmitted through one of the color filters to increase the efficiency of the display according to conventional methods.

Response to Arguments

Applicant's arguments with respect to claims 1-11 have been considered but are moot in view of the new ground(s) of rejection.

Contact Information


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael H. Caley whose telephone number is (571) 272-2286. The examiner can normally be reached on M-F 8:30 a.m. - 5:00 p.m..

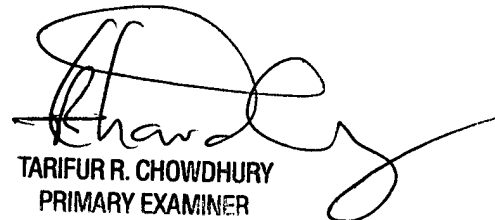
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Michael H. Caley
August 20, 2005


mhc


TARIFUR R. CHOWDHURY
PRIMARY EXAMINER